

In re Patent Application of:
KAMENOFF
Serial No. 10/694,635
Filing Date: October 27, 2003

In the Claims:

1. (CURRENTLY AMENDED) A self-heating battery for delivering its rated capacity when the battery is below a temperature when available battery capacity is limited comprising:

a battery;

a heating element operatively connected to the battery and powered therefrom for heating the battery;

a temperature sensor for determining the temperature of a battery and sensing temperature when the battery temperature is below a temperature where available capacity is limited indicative of a predetermined temperature above a minimum specified operating temperature of the battery; and

a switch circuit operatively connected to said heating element and temperature sensor and responsive to said temperature sensor for switching on the heating element and raising the temperature of the battery to allow the battery to deliver its rated capacity when a sensed temperature of the battery is ~~below a~~ below the temperature where available battery capacity is limited, said switch circuit comprising non-parallel, serially connected transistors, and further comprising

a comparator circuit operatively connected to said temperature sensor and having an output operatively connected to at least one transistor in said switch circuit to switch on the heating element when temperature is below a temperature where available capacity is limited;

a load current sensor; and

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a low current comparator and a high current comparator each having inputs operatively connected to said load current sensor to determine its voltage drop and each having an output operatively connected to at least one transistor in said switch circuit to lock out the heating element when a battery cell is not in use to prevent the heating element from discharging the battery when stored at cold temperatures; and a battery discharge circuit operatively connected to said battery for discharging said battery and operatively connected to said heating element, load current sensor and switch circuit and operative for locking out the heating element when a battery is not in use and turning off the heating element when a discharge current is high.

2. (CANCELLED)

3. (PREVIOUSLY PRESENTED) A self-heating battery according to Claim 1, wherein a transistor in said switch circuit comprises at least one field effect transistor.

4. (PREVIOUSLY PRESENTED) A self-heating battery according to Claim 1, wherein said comparator connected to said switch and said temperature sensor is operative for comparing temperature differential and turning the switch on and off and controlling operation of the heating element.

Claim 5-11 (CANCELLED)

12. (CURRENTLY AMENDED) A self-heating battery according to ~~Claim 11~~ Claim 1, wherein said battery discharge

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circuit further comprises a light sensing circuit operatively connected to the battery discharge circuit that actuates the battery discharge circuit after exposing to light the light sensing circuit.

13. (ORIGINAL) A self-heating battery according to Claim 1, and further comprising a charge protection circuit operatively connected to said battery for limiting damage to the battery during charging.

14. (ORIGINAL) A self-heating battery according to Claim 1, and further comprising a flying cell circuit operatively connected to said battery for meeting open circuit and cut-off voltage requirements.

Claims 15-23 (CANCELLED)